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EXAMINER	
MILORD, MARCEAU	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/699,019	Applicant(s) ROFOUGARAN, AHMADREZA	
	Examiner Marceau Milord	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,12,13,20-35,46 and 54-66* is/are rejected.

7)☒ Claim(s) *2-11,14-19,36-45 and 47-53* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 12-13, 31-35, 46, 54-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stikvoort (US Patent No 6236847 B1) in view of Yu et al (US Patent No 6804359 B1).

Regarding claim 1, Stilvoort discloses a notch filter (fig. 1), comprising:
a first polyphase filter (16 of fig. 1) to output a plurality of phases (col. 3, lines 6-32); and a second polyphase filter (19 of fig. 1) having an input to receive the first phase and an input to receive the first phase (col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by

exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claims 12-13 Stilvoort discloses a notch filter (fig. 1), comprising:
a first polyphase filter (16 of fig. 1) including an input, and an output having a non-inverted output (col. 3, lines 6-32;col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of a second polyphase filter having an input comprising a non-inverted, the non-inverted output of the first polyphase filter being coupled to the input of the second polyphase filter and the output of the first polyphase filter.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claims 31-33, Stilvoort discloses a circuit (fig. 1), comprising: a mixer 94 of fig. 1) having an output including a mixed signal output and an inverted mixed signal output (col. 3, lines 6-32); and a polyphase filter (16 of fig. 1) having an input including a non-inverted input coupled to the inverted mixed signal output (col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of an inverted input coupled to the non-inverted input mixed signal output; the mixed signal output comprising one of the in-phase and quadrature components, and the inverted mixed signal output comprising one of the inverted in-phase and inverted quadrature components.

However, Stilvoort does not specifically disclose the feature of second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the

system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claim 34, Stilvoort as modified discloses a circuit (fig. 1), wherein the polyphase filter comprises an output having a notch at a particular frequency (fig. 4; col 5, lines 15-65).

Regarding claim 35, Stilvoort as modified discloses a circuit (fig. 1), wherein the polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at the particular frequency (16 and 19 of fig. 1; col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

Regarding claim 46, Stilvoort discloses a circuit (fig. 1), comprising: a first polyphase filter (16 of fig. 1) having an output including a non-inverted output (col. 3, lines 6-32; col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of second polyphase having an input including a non-inverted input coupled to the output of the first polyphase and an input coupled to the non-inverted output of the first polyphase filter.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines

51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claims 54-57, Stikvoort discloses a circuit (fig. 1) comprising: mixing means (4 of fig. 1) for mixing two signals and outputting a mixed signal and an inverted mixed signal (col. 3, lines 6-56; 14 of fig. 1; 16 and 19 of fig. 1; col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of filtering means for notching a particular frequency of the mixed signal; and a means for generating a zero at the particular frequency, and the second polyphase structure comprises means for generating a second zero at the second frequency.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal

content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs.. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claim 58, Stikvoort as modified discloses a circuit (fig. 1) further comprising a third filtering means for attenuating frequencies above a third frequency of the mixed signal, the third frequency being higher than the particular and second frequencies (col. 3, line 40- col. 4, line 54).

Regarding claim 59, Stikvoort discloses a circuit (fig. 1), comprising: first filtering means (14 of fig. 1) for notching a first frequency of a signal using a first polyphase structure (16 of fig. 1) and second filtering means of the signal using a second polyphase structure (19 of fig. 1;col. 3, lines 7- 56; col. 4, lines 32-54).

However, Stilvoort does not specifically disclose the feature of second filtering means for notching a second frequency of the signal, the second frequency being different from the first frequency.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially

removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claim 60, Stikvoort as modified discloses a circuit (fig. 1), wherein the first polyphase structure comprises means for generating a first zero at the first frequency, and the second polyphase structure comprises means for generating a second zero at the second frequency (col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

Regarding claim 61, Stikvoort as modified discloses a circuit (fig. 1), further comprising a third filtering means for attenuating frequencies above a third frequency of the signal, the third frequency being higher than the second frequency (col. 3, line 40- col. 4, line 54).

Regarding claims 62-64, Stikvoort discloses a method of filtering a signal (fig. 1) comprising notching a particular frequency of the signal using a polyphase structure (16 and 19 of fig. 1;col. 3, lines 6-51).

However, Stilvoort does not specifically disclose the step of notching a second frequency of the signal, the second frequency being different from the first frequency.

On the other hand, Yu et al, from the same field of endeavor, discloses a signal processor for reducing undesirable signal content that reduces the undesirable signal content by exaggerating the undesirable signal content and then using this exaggerated undesirable signal and adaptive filter means to estimate the undesirable content in the signal and then substantially removing it from the signal. The signal processor includes a signal mapping means for exaggerating the undesirable signal content; and an adaptive filter means for reducing the undesirable signal content using the exaggerated undesirable signal content (figs. 67;col. 2, lines 51-57; col. 3, lines 53-58; col. 4, lines 10-33). Furthermore, the analog circuit receives an input signal and this circuit resolves the input signal into a constituent pair. In addition, Yu shows in figure 8, two polyphase filters that are responsive to produce the correct mapping for the imperfect signals. In addition, the signal mapping circuit provides the correct mapping for the imperfect signals to produce signals and signals suitable for input signals for the adaptive filter with a small and large amount of undesirable signal content, respectively (figs. 8-10, 12-13; col. 5, lines 8-26; col. 5,lines 55- col. 6, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Yu to the system of Stilvoort in order to provide a polyphase filter circuit that can produce asymmetric poles as well as zeros.

Regarding claim 65, Stikvoort as modified discloses a method of filtering a signal (fig. 1) wherein the notching of the particular frequency comprises generating a zero at the particular frequency using the polyphase structure, and the notching of the second frequency comprises generating a second zero at the second frequency using the second polyphase structure (col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

Regarding claim 66, Stikvoort as modified discloses a method of filtering a signal (fig. 1) further comprising attenuating frequencies above a third frequency of the mixed signal, the third frequency being higher than the particular and second frequencies (col. 1, line 61- col. 2, line 21; col. 3, line 34- col. 4, line17).

3. Claims 20-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stikvoort (US Patent No 6236847 B1) in view of Rich (US Patent No 5307517).

Regarding claim 20, Stikvoort discloses a notch filter (fig. 1), comprising: generating means (16 of fig. 1) for generating an output signal comprising a plurality of phases of an input signal (col. 3, lines 6-32; col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the feature of a notching means for notching a particular frequency of the input signal as a function of the phases.

On the other hand, Rich, from the same field of endeavor, discloses an adaptive notch filter for removing undesired co-channel FM interference that includes in-phase and quadrature signal processing paths in which the undesired FM signal is translated to zero frequency, i.e. to DC. In each of the in-phase and quadrature phase signal paths, a first multiplier translates the input frequency spectrum in a dynamic manner so that the frequency of the undesired FM signal is always centered on DC. The output of the high pass filter is demultiplexed in a second

multiplier to translate the desired FM signal back to the original position in the frequency spectrum. The output the in-phase and quadrature signal processing circuits are combined in an adder circuit to cancel the unwanted difference frequency demodulation signal (col. 2, lines 5-35; col. 3, line 31- col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Rich to the system of Stilvoort in order to implement adaptive notch filter to cancel co-channel interference.

Regarding claim 21, Stikvoort as modified Stikvoort discloses a notch filter (fig. 1), wherein the input signal comprises a differential signal (col. 3, lines 6-32).

Regarding claim 22, Stikvoort as modified discloses a notch filter (fig. 1), wherein the generating means (16 of fig. 1) further comprises means for generating the output signal with quadrature outputs when the input signal includes the particular frequency (col. 4, lines 1-49).

Regarding claim 23, Stikvoort as modified discloses a notch filter (fig. 1), wherein the notching means comprising means for rejecting the quadrature signal at the particular frequency (col. 2, lines 19-52; col 3, lines 14-46).

Regarding claim 24, Stikvoort as modified discloses a notch filter (fig. 1), wherein the particular frequency is an odd harmonic of the input signal (col. 3, line 34- col. 4, line 17).

Regarding claim 25, Stikvoort as modified discloses a notch filter (fig. 1), wherein the particular frequency is a third harmonic of the input signal (col. 1, line 61- col. 2, line 21; col. 3, line 34- col. 4, line17).

Regarding claim 26, Stikvoort discloses a method of notching a particular frequency of a signal (fig. 1), comprising: generating (16 of fig. 1) an output signal comprising a plurality of

phases of an input signal (col. 3, lines 6-32; col. 3, line 33- col. 4, line 31; col. 1, line 48- col. 2, line 29).

However, Stilvoort does not specifically disclose the step of notching the particular frequency of the input signal as a function of the phases.

On the other hand, Rich, from the same field of endeavor, discloses an adaptive notch filter for removing undesired co-channel FM interference that includes in-phase and quadrature signal processing paths in which the undesired FM signal is translated to zero frequency, i.e. to DC. In each of the in-phase and quadrature phase signal paths, a first multiplier translates the input frequency spectrum in a dynamic manner so that the frequency of the undesired FM signal is always centered on DC. The output of the high pass filter is demultiplexed in a second multiplier to translate the desired FM signal back to the original position in the frequency spectrum. The output the in-phase and quadrature signal processing circuits are combined in an adder circuit to cancel the unwanted difference frequency demodulation signal (col. 2, lines 5-35; col. 3, line 31- col. 4, line 41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Rich to the system of Stilvoort in order to implement adaptive notch filter to cancel co-channel interference.

Regarding claim 27, Stikvoort as modified discloses a method of notching a particular frequency of a signal (fig. 1), wherein the generation of the output signal comprises generating the output signal with quadrature outputs when the input signal includes the particular frequency (col. 4, lines 1-49).

Regarding claim 28, Stikvoort as modified discloses a method of notching a particular frequency of a signal (fig. 1), wherein the notching of the particular frequency comprises rejecting the quadrature signal at the particular frequency (col. 2, lines 19-52; col 3, lines 14-46).

Regarding claim 29, Stikvoort as modified discloses a method of notching a particular frequency of a signal (fig. 1), wherein the particular frequency is an odd harmonic of the input signal (col. 3, line 34- col. 4, line 17).

Regarding claim 30, Stikvoort as modified discloses a method of notching a particular frequency of a signal (fig. 1), wherein the particular frequency is a third harmonic of the input signal (col. 1, line 61- col. 2, line 21; col. 3, line 34- col. 4, line17).

Allowable Subject Matter

4. Claims 2-11, 14-19, 36-45, 47-53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments with respect to claims 1, 12-13, 20-35, 46, 54-66 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 571-272-7853. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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4-14-06